REMARKS

The Specification

The specification has been objected to because of an informality. In accordance with the Office's suggestion, the term "and" has been changed into "any." Accordingly, withdrawal of the objection is respectfully requested.

The Claims

Claims 1-8, 15 and 16 are currently pending. Claims 9-14, which are drawn to non-elected subject matter, have been canceled in the present amendment without prejudice of or disclaimer to the subject matter of the claims. Applicants reserve the right to pursue the subject matter of claims 9-14 in a continuation and/or divisional application.

Allowable Subject Matter

Applicants gratefully acknowledge the indication by the Examiner that claim 7 is allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. In accordance with the Examiner's indication, claim 7 has been rewritten in independent form as new claim 16. This amendment is made solely to expedite prosecution, and does not represent acquiescence by Applicants to any rejections.

Claim Rejection – 35 U.S.C. §102

Claims 1 and 2 were rejected under 35 U.S.C. § 102 on the basis of Klass et al patent (US 3,253,200).

Klass is concerned with a chuck which is a clamp used to hold an article (e.g. block 62). By the very nature of chucks, they are immobile or are static. This sort of device is not in the same area as the present invention. As illustrated in the various embodiments in the present application, a device in accordance with the present invention is concerned with dynamic devices such as clutches.

Second, Klass is concerned with a dielectric plate arranged between the parallel electrodes and the electrorheological fluid such that an adhesive force is effected when an AC electric field is applied to the electrodes. Again, this setup is static. Since the setup is static in nature, there is not any anticipated external stress field as recited in claim 1. Nor is there any relationship of a direction of an electric field and an anticipated external stress (which does not exist in Klass).

Third, in Klass the adhesive force produced is to downwardly secure the block on the electrodes. It thus can be seen that the field generated is normal or perpendicular to the direction of the electrodes.

Due to the above differences, Klass does not anticipate the claims. Nevertheless, to facilitate the progress of the application, claim 1 has been amended to recite that electrodes in the configuration are in motion in relation to electrorheological fluid, in order to highlight the dynamic nature of the present invention. The basis for this amendment can be found at at least page 6, in which it is disclosed that the electrodes (4, 5) are mounted on the inner cylinder which are rotatable in relation to the outer cylinder and of course the layer of electrorheological fluid between the inner and outer cylinders. Klass clearly does not teach this feature. With this amendment, claim 1 is submitted to be clearly distinct from Klass, which does not disclose any movable electrodes.

Claim Rejections – 35 U.S.C. §103(a)

Claims 3-5 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Carlson (US 5,054,593) in view of Klass et al. (US 3,253,200).

In rejecting claims 3-5, the Office Action states that "The Carlson device is an electrorheological clutch having a cylindrical drive member 14 having electrode strips 38 disposed thereon." Applicants respectfully disagree.

The Carlson patent discloses a torque coupling system that uses an electrophoretic fluid. As depicted in FIGS. 4a-4b and col. 5, l. 42 through col. 6, l. 13 of the Carlson patent, the viscosity of an electrophoretic fluid decreases as an electric field is applied thereto, while the viscosity of electrorheological fluid increases as an electrical field is applied. Clearly, the electrophoretic fluid of Carlson's system would not work in Klass et al.'s system. With regard to these opposite responses to the electric field, the Carlson patent states that "because the electrophoretic fluids operate in a substantially different manner from electrorheological fluids in the presence of an electric field, their use in existing electrorheological fluid clutches and other devices would not function in many instances. One viscous coupling arrangement which is constructed to use an electrophoretic fluid is disclosed in Klass et al., U.S. Pat. No. 3,255,835 (col. 1, l. 57-61)." As such, Applicants respectfully submit that the teachings of Carlson and Klass et al. cannot be combined to derive the recitations of claim 3.

In addition, the Office has acknowledged that "the strips in Carlson patent are not alternating polarity as claimed and this would not generate a significant component perpendicular to the axis of rotation and parallel to the surface of the members." The strips 38 of Carlson's system are non-conducting strips (col. 4. l.

52-55). The strips 38 provide spaces 40 for holding a particle-rich phase of fluid therein during the disengaging stage, as described in FIG. 4b and col. 5, l. 62 – col. 6, l. 13, where the particle-rich phase of fluid migrates towards the housing upon switching the electric field polarity (FIG. 4c). In contrast, the strips of Klass et al.'s system are formed of conducting material. Furthermore, Klass et al.'s system does not require the spaces of Carlson's system and, as a consequence, the strips are embedded in a non-conductive base member. As the function and material of the strips of Carlson's system are clearly different from those of Klass et al.'s system, the strips of Carlson's system would not work properly in Klass et al.'s system. Accordingly, Applicants respectfully submit that the teachings of Carlson and Klass et al. cannot be combined to derive the recitations of claim 4.

Furthermore, in Carlson's system, the electric field is applied in a direction normal to the surfaces of the drive and driven members. In contrast, in Klass et al.'s system, the electric field is applied parallel to the surfaces of the members. As the direction of the electric field determines the characteristics of shear resistance of electrorheological fluids, the electrical configuration of Carlson's system would not work properly in Klass et al.'s system. Again, Applicants respectfully submit that the teachings of Carlson and Klass et al. cannot be combined to derive the recitations of claim 3.

There is no finding of record in the cited references that would motivate a skilled artisan to combine Carlson's and Klass et al.'s systems to get over the differences discussed above and to derive the recitations of claims 3-4. Furthermore, the cited references are silent on the recitation: "the spacing between the rotor and the cylindrical housing is of the same order as the spacing between the strip electrodes"

as recited in claim 5. As such, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and, claims 3-5 are patentable.

Claims 6 and 8 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Carlson (US 5,054,593) in view of Klass et al. (US 3,253,200) as applied to claims 3-5 above, and further in view of Kasahara (US 4,864,461).

This rejection is predicated on the characterization of the Carlson and Klass et al. patents, which is respectfully traversed, as pointed above. As such, Applicants respectfully submit that the rejection of claims 6 and 8 lacks foundation and must be withdrawn.

In rejecting claims 6 and 8, the Office has acknowledged that it is unclear from Klass et al. whether the electrodes extend from opposite ends and are of equal length. Then, the Office has stated "Kasahara shows an electrode arrangement in FIG. 4 wherein positive and negative electrodes extend from opposite directions on cylindrical member 26. In incorporating the Klass et al. electrode configuration in Carlson, it would have been obvious, further in view of Kasahara, to extend the electrodes for opposite directions and provide the electrodes of equal strength, the motivation being to achieve uniform field strength through the length of the cylindrical member." Applicants respectfully disagree.

The Kasahara patent discloses an electrostatic paper feeding device. There is no disclosure in the cited references that would motivate a skilled artisan to combine the teachings to derive the cylindrical rotor that is provided at opposite ends with first and second electrodes as recited in claim 6. Furthermore, it is unclear why one of ordinary skill in the art would even look to an electrostatic paper feeding

device for teachings as to electrorheological fluid, let alone selectively combine isolated teachings to arrive at the subject matter of claim 6. As such, Applicants respectfully submit that a *prima facie* case of obviousness has not been established, and claim 6 is further patentable. Claim 8 depends from claim 6, rendering it also patentable for at least the same reasons.

Conclusion

Based on the reasons as set forth above, Applicants respectfully request allowance of all pending claims.

In the event that there are any questions concerning this paper, or the application in general, the Examiner is respectfully urged to telephone Applicants' undersigned representative so that prosecution of the application may be expedited.

Respectfully submitted,

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